



Falls Lake Rules

*Upper Neuse River Basin Association
Modeling Kickoff Meeting – Sept 28, 2016*

Department of Environmental Quality





- Falls Nutrient Strategy Rule Requirements
- Implementation Status
- Recent Legislation / Impact on Rules Readoption



- Strategy in place to address lake Chl-a impairment
- Rules Effective January 15, 2011
- Falls Rules
 - .0275 Purpose & Scope (Goals)
 - .0276 Definitions
 - .0277 Stormwater – New Development
 - .0278 Stormwater – Existing Development
 - .0279 Wastewater Discharges
 - .0280 Agriculture
 - .0281 Stormwater – State & Federal Entities
 - .0282 Trading

Purpose & Scope

15A NCAC 2B .0275

- Establishes Framework for Rules
 - Adaptive Management & Staged Implementation
- Stage I (2011- 2021)
 - Initial reductions watershed wide (20% TN & 40% TP)
 - Achieve standards in lower lake
- Stage II (2021 – 2036)
 - Overall reduction objectives (40% TN 77% TP)
 - Achieve standards throughout lake by 2041
- Division required to report to EMC every 5 years
 - First report provided January 2016
 - 2025 Report – “Relook”



- Post-construction runoff meet N & P rate targets
 - 2.2 lbs/ac/yr TN .33 lbs/ac/yr TP
- Implemented by Local Governments Programs
- Land Disturbance Thresholds & Nutrient Offset Option
- Implementation Status
 - Local government implemented local programs - July 2012



- Load Reducing Activities on Existing Developed Land
- Implemented by Local Governments in Two Stages
 - Stage I: Back to 2006 baseline by 2020
 - Stage II: 40% TN & 77% TP – Update plans every 5 years
- Implementation Status
 - LGs submitted inventories in 2013
 - Model Program Presented to EMC July 2013
 - Implementation delayed to add additional credit measures
- Expanding credit measures toolbox - Ongoing
 - Division and UNRBA working together to add measures



- Reductions from Wastewater Dischargers
- Establishes Nutrient Allocations
 - Stage I: 20% TN & 40% TP reductions by 2016
 - Stage II: 40% / 77% reductions by 2036
- Implementation Status
 - Reductions of 20% TN and 67% TP achieved as of 2014
 - Two of the three plants have invested in upgrades
 - Reductions also achieved through improved management of current technology
- Dischargers evaluating Stage II technologies



- Reductions from Agriculture Operations
 - Applies to Row Crops & Pasture
- Stage Collective Compliance Approach
 - Stage I: 20% TN & 40% TP by 2020
 - Stage II: 40% TN & 77% TP by 2036
- Implementation Status
 - Watershed Oversight Committee Formed - Implementation & AR
 - Estimated 46% N loss reduction in crop year 2014
 - No increase in phosphorus loss risk
- Next annual report due to EMC in November



- Stormwater requirement for State & Fed lands
 - Similar to requirements for local governments
- NCDOT requirements
 - New Development
 - New DOT road projects meet buffer requirements
 - Existing Development
 - Minimum of at least 6 stormwater retrofits per year
- Implementation Status
 - New Development req implemented in 2011 / 2014
 - NCDOT implementing existing development in 2014.



- Provides option to sell/buy reductions across sources
- Includes requirements for parties buying / selling credits
- Sets Geographic limitations
 - Impacts in lower ws – offset anywhere in ws
 - Impacts in upper ws – offset must be in upper ws



- S.L. 2016-94: Nutrient Framework Section 14.13.(a)
 - UNC Evaluation of F/J Management Strategies
 - Calls for Several Studies by Department
 - Revises Dates for EMC Readoption of Falls Rules



- Impact on Falls Rules Readoption
 - Sets Falls & Jordan on own Readoption Timeline
 - EMC to Convene Stakeholder Working Group Dec 2016
 - Directs EMC to begin rule readoption process by March 2019
 - Prevents readoption of Falls Rules until October 2022

Timeline Summary

S.L. 2014-94



Task	Reporting Date	Responsible Party
Nutrient Offsets Study	December 1, 2016	DMS / DWR
CBP Stormwater BMP Values	December 1, 2016	DEMLR
Convene Stakeholder Working Group	December 31, 2016 (EMC Approval of Working Group in November)	EMC
In Situ Study	March 1, 2018 (Interim Report March 1, 2017)	DWR
UNC Evaluation of Falls & Jordan Nutrient Management Strategies	Jordan: December 31, 2018 (Interim 2016 / 2017) Falls: December 31, 2021 (Interim Reports 2019 / 2020)	UNC
Begin Falls / Jordan Rules Readoption	March 2019	EMC



QUESTIONS?



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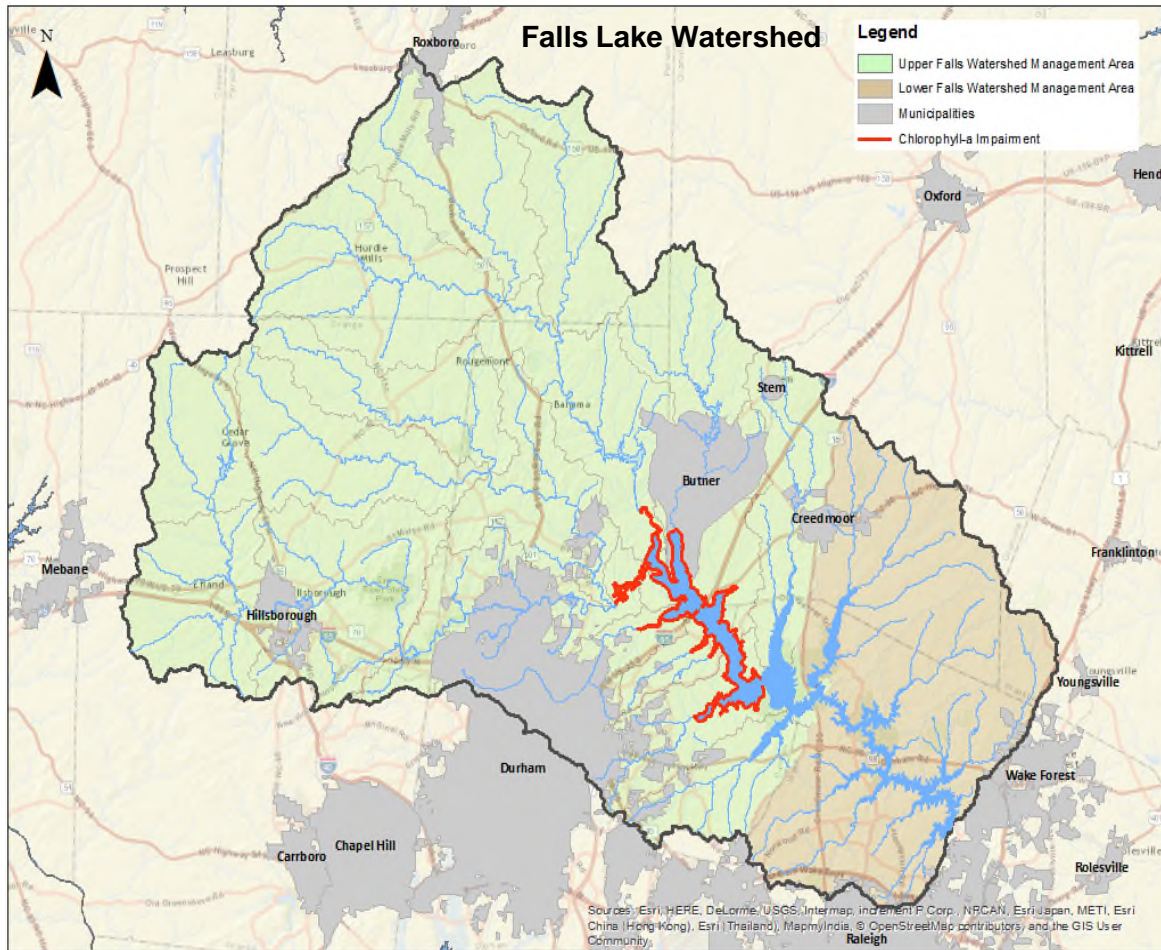




Slides in Reserve

2016 Falls Lake Status Report

Falls Lake Watershed



770 sq/mi watershed located in upper Neuse River Basin

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Falls Lake Local Governments

Municipalities

Butner
Creedmoor
Durham
Hillsborough
Raleigh
Roxboro
Stem
Wake Forest

Counties

Durham
Franklin
Granville
Orange
Person
Wake



2016 Falls Lake Status Report

Falls Lake Nutrient Strategy History



- Strategy in place to address lake Chl-a impairment
- Rules effective January 2011
 - Require reductions from both point & nonpoint
 - Staged adaptive implementation
- Stage I (2011 – 2021)
 - Initial reductions watershed wide
 - Achieve standards in lower lake
- Stage II (2021 – 2036)
 - Additional reeducations in upper watershed
 - 40% TN and 77% TP reductions
 - Achieve standards throughout lake by 2041



- Division required to report to the EMC every 5 years
- Purpose
 - Provide update on strategy implementation
 - Evaluate changes in loading & lake water quality progress
 - Review advancements in science & control technology
- Information provided by multiple Divisions & stakeholders

- Background & History
- Implementation & Water Quality Progress
 - Strategy Progress
 - Changes in Loading to Lake
 - Lake Improvement
- Advances in Science & Control Technology
 - Wastewater & Stormwater Treatment Technology
 - Current & Projected use of Reuse & Land Application
 - Programmatic Measures
 - Updates to Accounting Tools
 - Utilization of Nutrient Offsets
 - Changes in Atmospheric Deposition
 - Summary of Groundwater, DSF, and Septic Studies

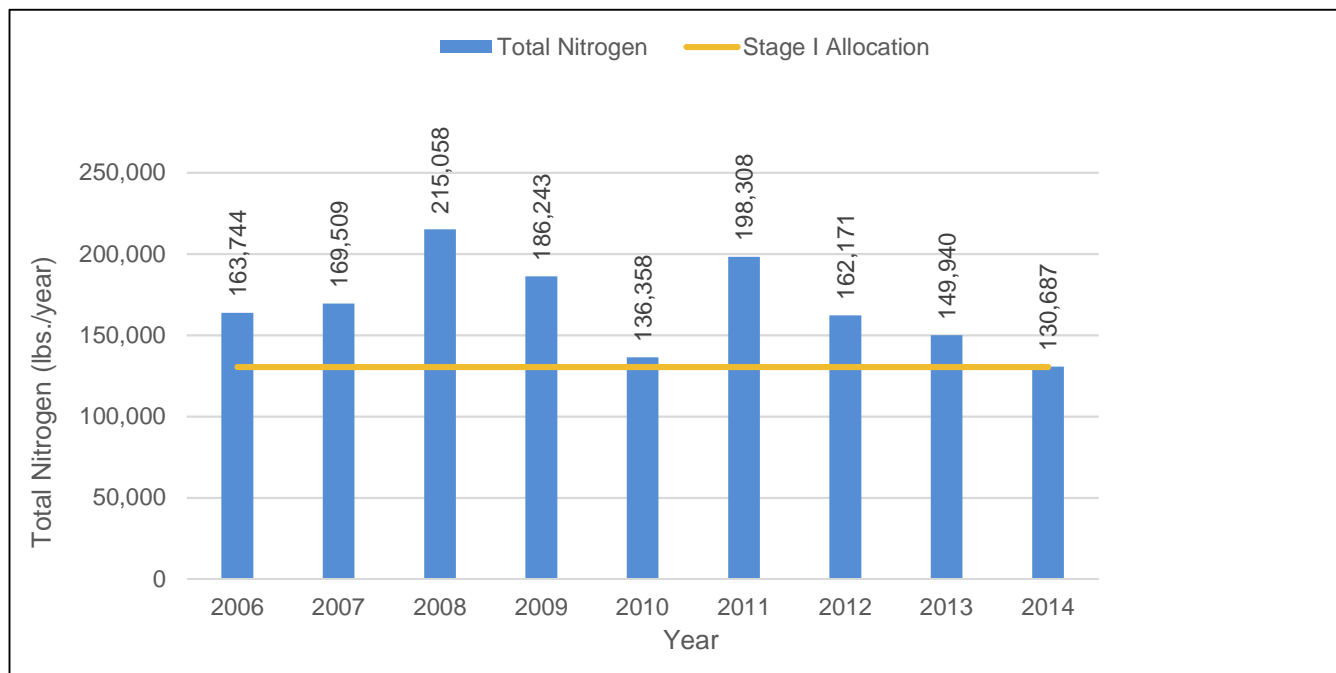


Falls Lake Stage I Rule Requirements

Source	Stage I Reduction Requirements
Wastewater	<ul style="list-style-type: none">• 20% TN & 40% TP Reductions by 2016
Agriculture	<ul style="list-style-type: none">• 20% TN & 40% TP Reductions by 2021
New Development Stormwater	<ul style="list-style-type: none">• Development meet rate targets:• 2.2 lbs/ac/yr TN and 0.33 lbs/ac/yr TP
Existing Development Stormwater	<ul style="list-style-type: none">• Local Governments Conduct Inventories• Reduce loads back to 2006 baseline
State & Federal Stormwater	<ul style="list-style-type: none">• Similar to LG requirements• NCDOT implements 6 retrofits per year

Falls Strategy Implementation Progress

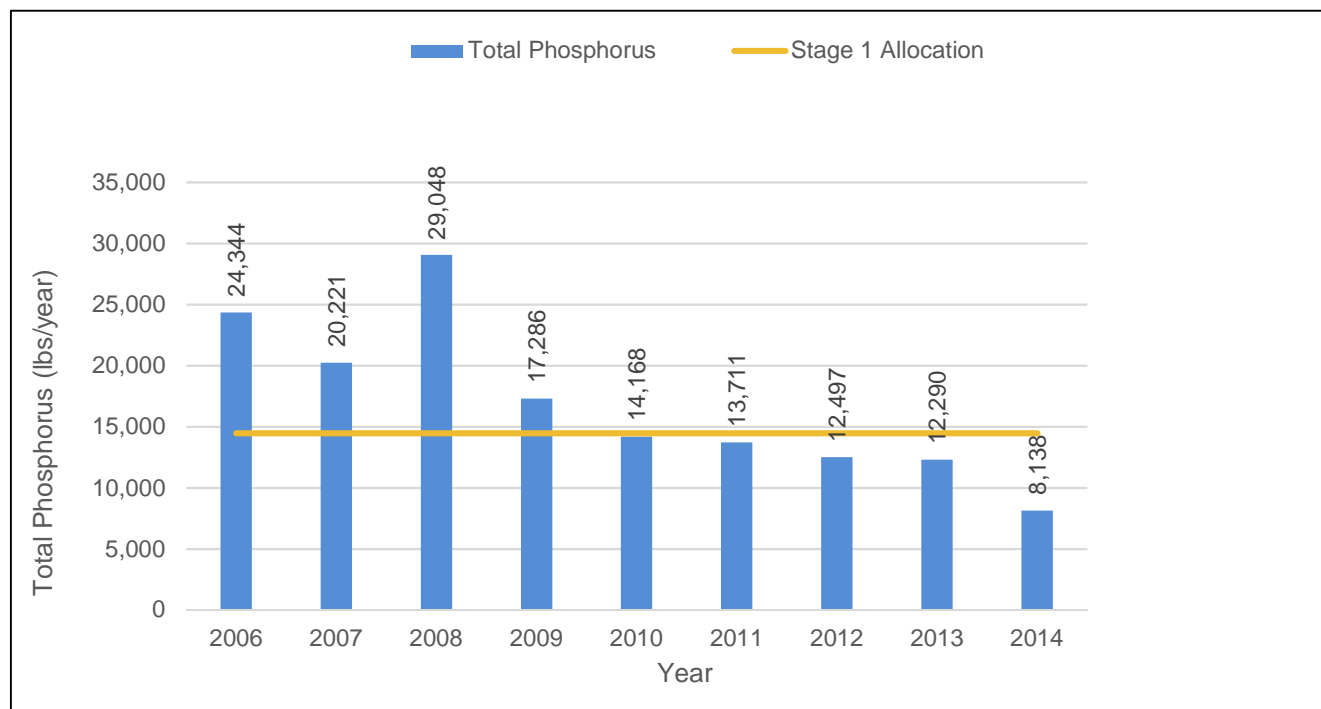
Wastewater Nitrogen Reductions



- 3 major dischargers in upper watershed
- Wastewater has achieved a 20% TN reduction as of 2014

Falls Strategy Implementation Progress

Wastewater Phosphorus Reductions



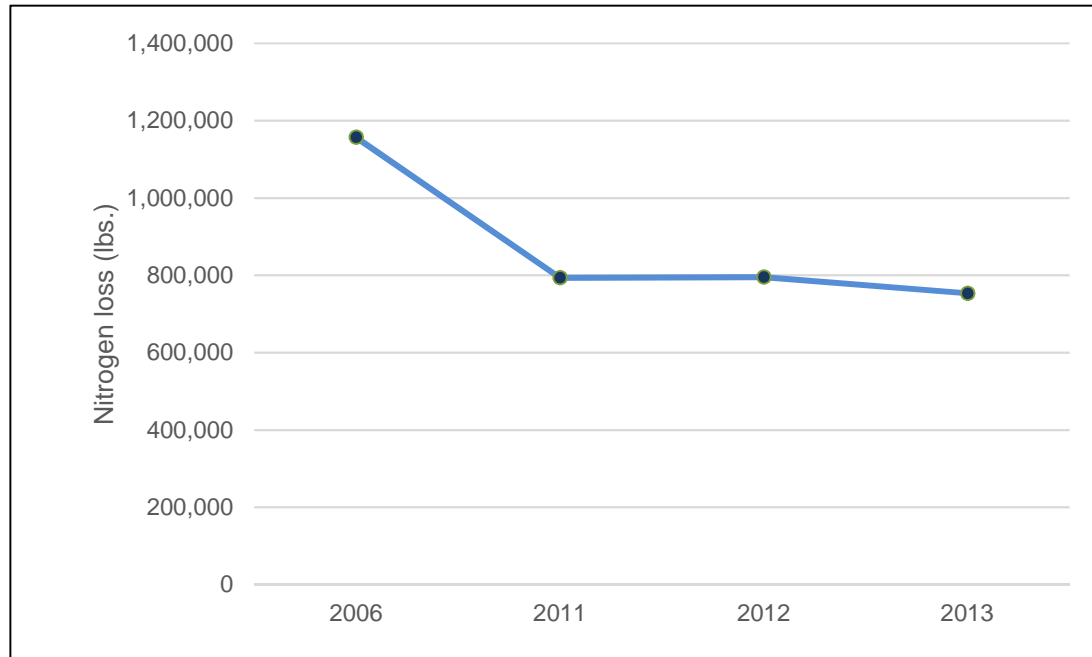
- Wastewater has achieved a 67% TP reduction as of 2014



- Two of the three plants have invested in upgrades
- Stage I reductions also achieved through improved management of current technology
- As flows increase more advanced technology needed to maintain Stage I limits
- Two of the three plants have invested in upgrades
- Stage I reductions also achieved through improved management of current technology
 - Reverse Osmosis
 - Increased Wastewater Reuse
 - Anammox bacteria

Falls Strategy Implementation

Agriculture Estimated N Loss Reductions



- Agriculture estimates 35% N loss reduction as of 2013
- No increase in phosphorus loss risk

Rule Implementation Status

New Development Stormwater



- LG's began implementing programs July 2012.
- State & Federal entities also implementing New D
- Nutrient Offset Payments as of June of 2015
 - 50,766 lbs. of nitrogen
 - 3,645 lbs. of phosphorus

	Nitrogen	Phosphorus
Total transactions	107	68
Total Credits (lbs)	50,766	3,645
Total Acres Mitigation	22.34	24.99

Rule Implementation Status

Existing Development

- Existing Development
 - LGs submitted inventories in 2013
 - Implementation delayed to add additional credit measures
- Expanding credit measures toolbox
 - Division and UNRBA working together
 - Expect to add 16 additional creditable practices
 - Improving accounting tools
- Division to bring model program to EMC in two years
 - Proposed extending Stage I to 2025 in rule revisions

Atmospheric Deposition

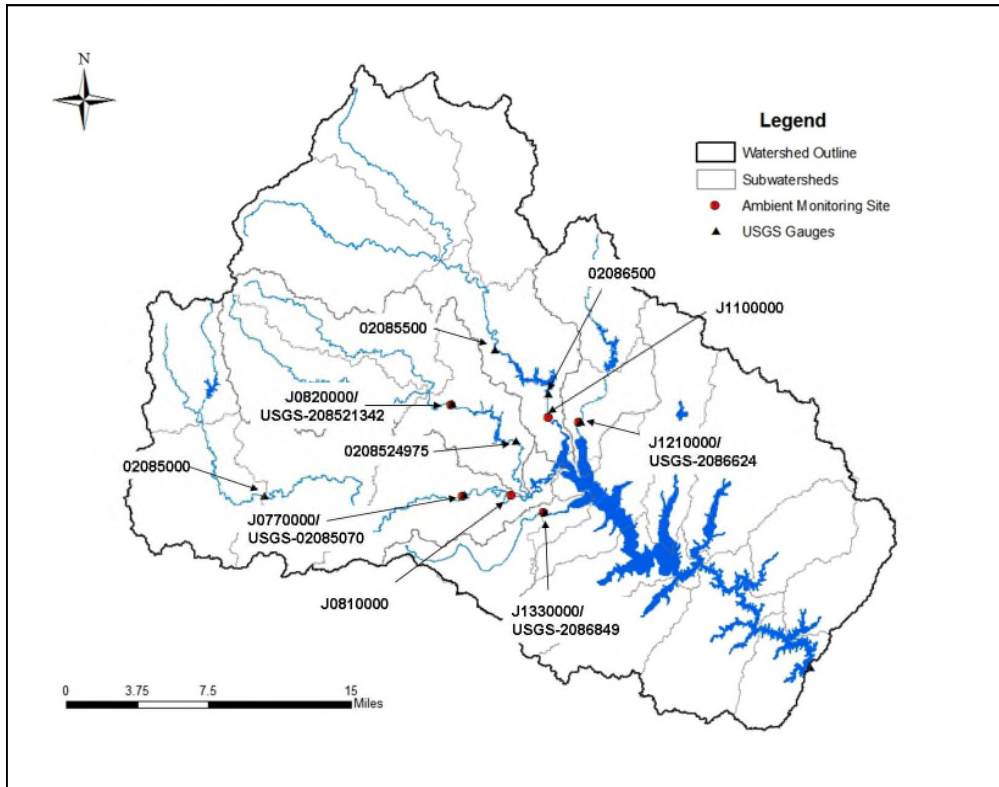
Trends in Atmospheric Deposition Reductions



- Report includes deposition data and modeling results
- 15% decline N deposition estimated since 2006
 - Due primarily to downward trend in nitrate deposition
- Reductions likely due to state & federal air quality initiatives
 - Clean Smokestacks Act
 - Reductions in motor vehicle emissions
- Additional reductions expected

Changes in Lake Loading

Loading from Upper Watershed



- DWR estimated annual nutrient loads
- Used Ambient Monitoring Stations and USGS Flow Stations
- Upper 5 major tributaries
 - Eno River
 - Little River
 - Flat River
 - Knap of Reeds
 - Ellerbe Creek

Changes in Loading to the Lake

2006-2014



Combined Nutrient Load from the Five Major Tributaries	Phosphorus (lbs/year)	Nitrogen (lbs/year)
2006	107,915	819,854
2007	82,283	691,397
2008	104,612	935,335
2013	56,223	925,732
2014	48,413	991,186

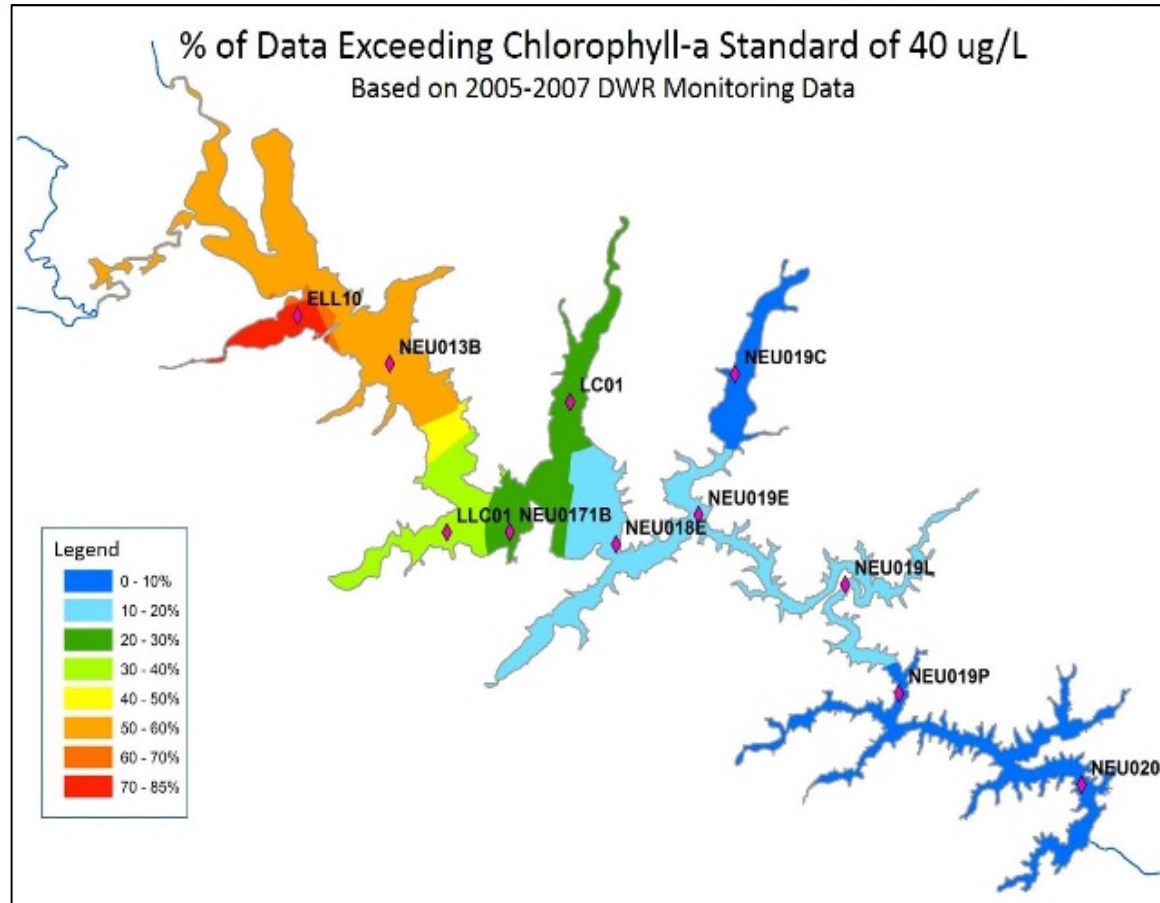
- Nitrogen load up 20% since baseline
- Phosphorus load down 55% since baseline

- 2014 was wet year with flows up 60 percent since baseline

Note: Load estimates are not available from 2009 to 2012 as budget constraints resulted in an insufficient number of sampling events to allow load estimation.

Lake Improvements: Water Quality in the Lake

2005-2007 (Before Rule Implementation)



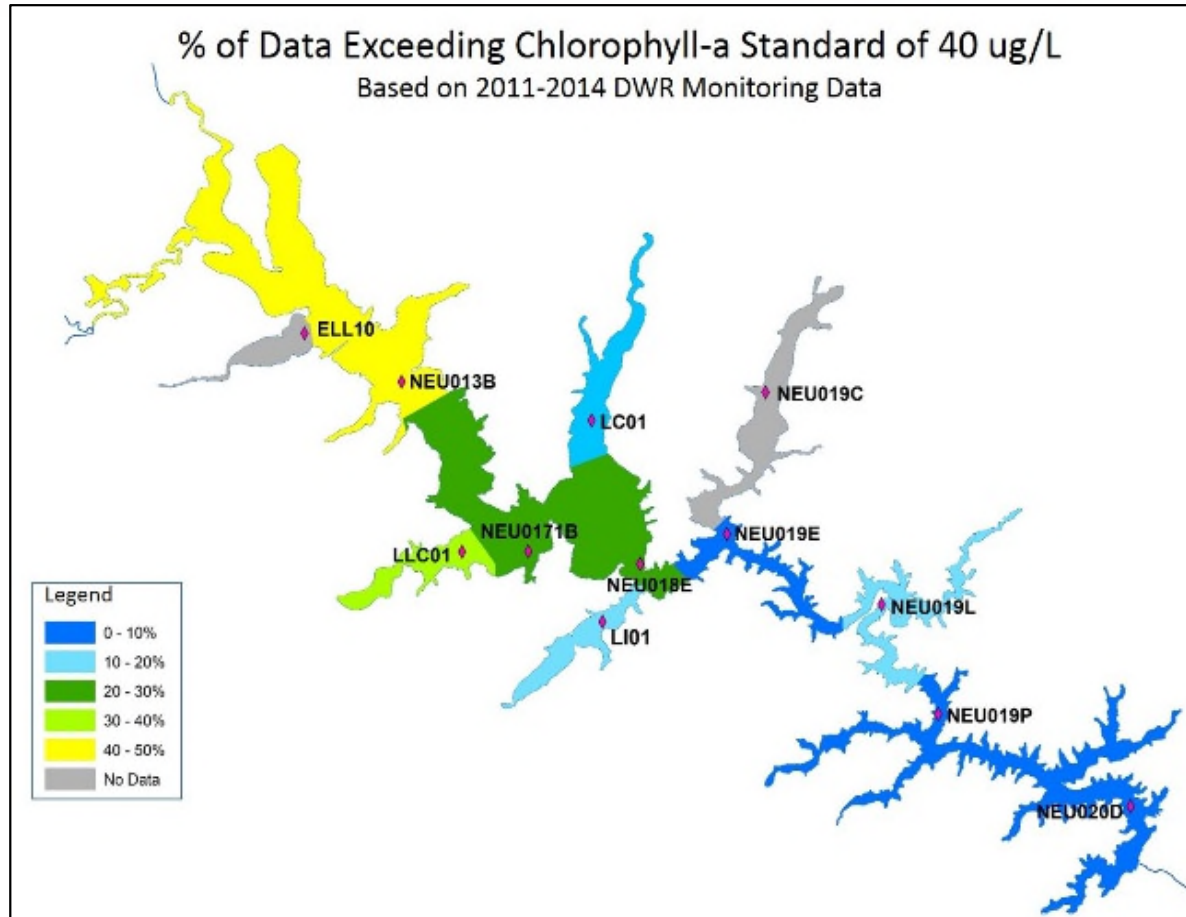
- Ten in lake stations monitored monthly by the Division

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Water Quality in the Lake

2011-2014 (Post Rule Implementation)



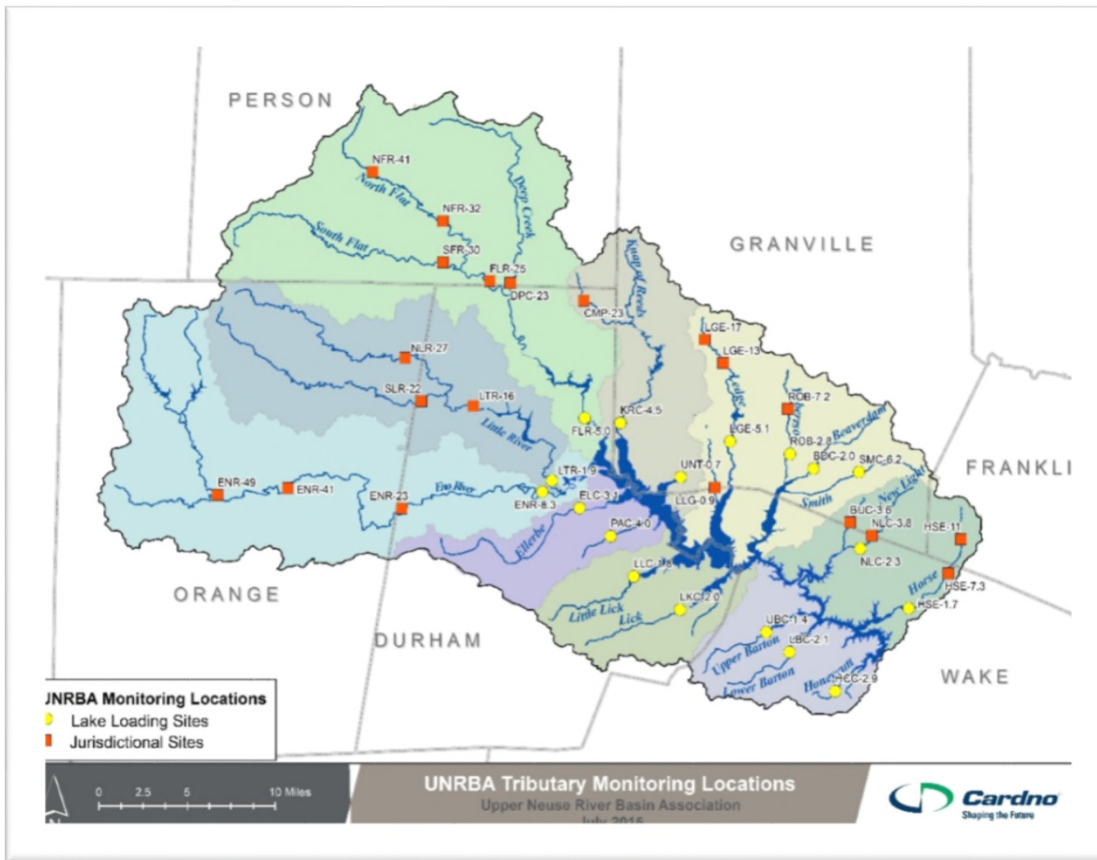
- % exceedance of chl-a standard has improved since 2011

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Supplemental UNRBA Monitoring

Routine & Special Studies



UNRBA has implemented supplemental monitoring:

- Address uncertainty of original modeling
- Fill data gaps and support supplemental lake model
- Support UNRBA's reexamination of Stage II rules

Falls Lake 2016 Status Report

Summary

- Implementation proceeding in timely fashion
- Sources on track to meet Stage I reduction goals
- Nutrient loading & water quality generally improving
- Regulated community working constructively & collaboratively with the Division

- Rules Readoption Process Ongoing
- Continue Credit Measures Work w/ UNRBA
 - Establish credit for additional 16 measures
- Complete Existing Development Model Program
 - Including load reduction assignments
 - Bring Model Program to EMC within next two years
- Next 5-year Report in 2021

Delay of Further Implementation - Jordan

S.L. 2016-94



Rule	Implementation Dates Pre-S.L. 2016-94	Date w/ Repeal of 3 Year Delay (SL 2015-241)	Post-S.L. 2016-94 Implementation Dates
New Development	August 2020	August 2017	Readoption
Existing Development Notification	UNH – March 2020 LNH & Haw – March 2023	UNH – March 2017 LNH & Haw – March 2020	UNH - Readoption LNH & Haw – March 2020
Point Sources	Compliance by 2022 / 2024	2019 / 2021	Readoption / 2021
Agriculture	Compliance by 2021 /2024	2018	Readoption
State & Federal New D	NCDOT 2013 / Non-DOT 2012	Already Implemented	Already Implemented
State & Federal ED	UNH – March 2020 LNH & Haw – March 2023	UNH – March 2017 LNH & Haw – March 2020	UNH - Readoption LNH & Haw – March 2020
Buffers	March 2011	Already Implemented	Already Implemented
Nutrient Management	2010 / 2012	Already Implemented	Already Implemented

Delay of Further Implementation - Falls

S.L. 2016-94

Rule	Implementation Dates Pre-S.L. 2016-94	Implementation Dates Post-S.L. 2016-94
New Development	Implemented 2012	Implemented 2012
Existing Development	Once Final Model Program Approved ~ 2017	Readoption
Point Sources	Stage I: Implemented 2016 Stage II Compliance: 2036	Stage I: Implemented 2016 Stage II: 2036
Agriculture	Stage I: Implemented 2013 Stage II Compliance 2036	Stage I: Implemented 2013 Stage II: 2036
State & Federal New D	NCDOT & Non-DOT: Implemented 2011	Implemented 2011
State & Federal ED	Once Final Model Program Approved ~ 2017	Readoption
Buffers	Already Implemented (Neuse NMS)	Already Implemented
Nutrient Management	Already Implemented (Neuse NMS)	Already Implemented